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AUTHOR Tarver, Linda K.; Carr, Dan B.
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ABSTRACT

Using a statewide sample of Louisiana's prospective teachers' results on the National Teacher Examinations (NTE) (N=5,642), the investigation probed the relationships between NTE composite scores, Weighted Common Examination Total (WCET) scores, and WCET subscores with selected predictor variables (overall grade point average (GPA); GPA in professional education courses; GPA in major teaching area; and ACT assessment composite and area scores). Two basic questions were addressed: (1) Which predictor variables or combination of predictor variables are effective predictors of examinees' composite NTE scores? and (2) Which among the predictor variables investigated are correlated with examinees' WCET scores? Using the Statistical Analysis System (SAS) package, multiple correlations and regression analysis were employed to determine the strength of the relationship between each predictor variable and combination of predictor variables and NTE composite scores or subscores. The best single predictor of NTE composite scores is ACT overall score. Final results of the analysis, along with descriptive data, are reported in narrative, tabular, and chart forms. (PN)

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TEACHER PROFICIENCY AND PERFORMANCE IN LOUISIANA

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by

Linda K. Tarver
Louisiana Department of Education

Dan B. Carr
Northwestern State University of Louisiana

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TEACHER PROFICIENCY AND PERFORMANCE IN LOUISIANA

Teacher certification, a debatable concept for years, has recently received sharp attack on both the political and social fronts. Reports of declining American College Test (ACT) scores, coupled with reports of drops in student performance on National Assessment tests, have focused attention upon the process of licensing of teachers. Legal actions by both parents and teachers have been filed against schools and school systems for failing to provide an appropriate education and have thus sharpened the attack on the process of teacher certification.

In an attempt to improve the quality of teachers entering the profession, certification agencies have begun to incorporate competency-testing into certification requirements. Today, at least nineteen states require prospective teachers to take the National Teacher Examinations (NTE) for certification purposes (Vlaanderen, 1982).

Phase One of the Teacher Proficiency and Performance research project has been built on the preliminary work accomplished by Tarver (1980). Using a statewide sample of prospective teachers' results on the NTE, the investigation probed the relationships between NTE Composite scores, WCET scores, and WCET subscores with selected predictor variables. Through the research, several basic questions were addressed. First, what predictor variables or combination of predictor variables are effective predictors of examinees' Composite NTE scores? Second, which among the predictor variables investigated are correlated with examinees' WCET scores? Subject descriptive data were used to partition the sample into subgroups in order to investigate differences existing among subgroups' NTE scores and subscores. Results of the data analysis have provided information for use in arriving at informed decisions about the performance of prospective teachers on the National Teacher Examinations. The outcomes of this investigation provide a useful basis for advising and counseling students seeking entrance into the teaching profession.

Population and Sample

The sample used in this study was drawn from those students who had been enrolled in the College of Education as undergraduate students in state-supported universities in Louisiana. These prospective teachers were candidates for a degree in teacher education and were seeking initial teacher certification, under Louisiana Certification requirements, in one or more teaching areas. This sample took the National Teacher Examinations (NTE) and graduated from a College of Education of an approved, public, four-year university in Louisiana between the fall of 1978 and the summer of 1981, inclusive. Fall 1978 was the beginning date for the requirement of attained NTE scores for initial teacher certification in Louisiana.

The composition of the population* was 81.1% Caucasian and 18.9% Other. Since eleven of the thirteen universities possible included in this study agreed to participate, the composition of the sample was 86.5% Caucasian and 13.5% Other.

Explanation of Variables

Data gathered on the sample (N=5,642) from the participating universities included each graduate's (a) Overall grade point average (G.P.A.), undergraduate; (b) G.P.A. in Professional Education courses; (c) G.P.A. in Major Teaching area; and (d) ACT Composite score and Area scores, where available. All grade point averages were computed on college hours pursued, rather than college hours earned, and were calculated from a student completed degree plan. The curricula for Professional Education G.P.A. were standardized, so that grades from courses similar at every university were used to compute grade point averages.

American College Test (ACT) scores gathered or supplied by the American College Testing Program were in the form of standard scores for ACT Composite and for each of the four areas of ACT Composite: (a) English, (b) Mathematics, (c) Social Studies, and (d) Natural Sciences. All data were coded on a data collection instrument.

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*Based upon graduation numbers provided by each of the 13 universities to the Bureau of Teacher Certification, Louisiana Department of Education.

NTE scores used were (a) Composite NTE score, (b) Area Examinations score, (c) Common Examinations score (WCET), and (d) scores on the subareas of the WCET (Professional Education; Written English Expression; Literature, Fine Arts, and Social Studies; and Science and Mathematics). WCET scores and subscores and Area Examinations scores and subscores used in this study were computed from results of the initial test results for each member of the sample. Composite NTE scores were computed using initial WCET scores and initial Area scores to reduce the effect of testing on subject scores. NTE scores and subscores were provided by Educational Testing Service.

Procedure

The appropriate administrative officers (usually the Deans of Education) at each of the thirteen public colleges/universities with approved teacher education programs in Louisiana were contacted personally for permission to use data from their graduates in the study.

The research study and use of the results of the data analysis were explained. Letters of consent were signed by eleven of the thirteen colleges/universities contacted. These consent letters gave the research team permission touse examinees' NTE scores and institutional data on each examinee.

Following receipt of consent letters, trained research teams computed and recorded descriptive and predictor variable data at each of the participating universities. Each research team was supervised for accuracy of data collection. Data gathered from each of the participating institutions were coded, key-punched, and compiled into a single computer data bank. NTE and ACT data on each participating university were coded on a computer tape and, using the same subject code as that used for the institutional data, were matched with data gathered at the institutions by the research teams.

Using the Statistical Analysis System (SAS) package, multiple correlations and regression analysis were employed to determine the strength of the relationship

between each predictor variable and combination of predictor variables and NTE Composite scores or subscores. Descriptive data were used to partition the sample into subgroups for purposes of comparison. Multiple analysis of variance techniques were used to compare the performance of subgroups. Final results of the analysis, along with descriptive data, are reported in narrative, tabular, and chart forms.

Description of the Performance of Louisiana's Potential Teachers on the National Teacher Examinations and Other Selected Variables

Data gathered on sample attribute variables, ACT scores, NTE scores, and on national ACT and NTE mean scores were used to describe Louisiana's potential teachers' performance on the NTE, ACT, and college courses pursued. A sample of 5,643 potential teachers was used to describe Louisiana's examinees' performance. Sample size varied on some variables due to the unavailability of data for portions of the sample. Thus, sample size used to compute descriptive statistics ranged from 5,643 to 4,409.

Overall Performance of Louisiana's Potential Teachers on the NTE and Other Selected Variables

Data were collected to describe the performance of Louisiana's potential teachers on the National Teacher Examinations (NTE) and the following selected variables: overall grade point average (G.P.A.), undergraduate; G.P.A. in Professional Education courses; G.P.A. in Major Teaching area; and American College Test (ACT) Composite scores and Area scores.

The mean Composite score for Louisiana's potential teachers (N=4,409) on the NTE was 1179.72, as indicated in Table 1. The mean score on the Common Examinations (WCET), which is required of all examinees regardless of their certification area, was 564.82. Although the mean score on the Area Examinations was 614.52, one should be very cautious in comparisons involving Area Examinations scores because there exist at least twenty-four separate examinations, none of which have been equated with each other nor with the Common Examinations. The mean grade

Table 1

Size, Means, and Standard Deviations of Louisiana's Potential Teachers on the National Teacher Examinations (NTE) and Other Selected Variables

Variable	Number	Mean	Standard Deviation
NTE Composite	4409	1179.72	153.59
NTE Area Exam	4436	614.52	81.30
NTE Common Exam	4682	564.82	83.18
PE	4682	56.98	9.48
WEE	4682	56.88	9.72
LFASS	4682	54.43	9.90
SM	4682	57.47	9.48
G.P.A. Major	5638	3.15	0.49
G.P.A. Education	5640	3.16	0.52
G.P.A. Overall	5643	2.95	0.47
ACT English	4463	17.98	4.96
ACT Mathematics	4463	16.47	6.67
ACT Social Studies	4463	15.78	7.04
ACT Natural Sciences	4463	18.83	5.75
ACT Composite	4463	17.39	5.17

CODE KEY

PE--------Professional Education Subdivision of the Common Examinations

WEE-------Written English Expression Subdivision of the Common Examinations

LFASS-----Literature, Fine Arts, and Social Studies Subdivision of the Common Examinations

SM--------Science and Mathematics Subdivision of the Common Examinations

G.P.A.----Grade Point Average

point averages (G.P.A.) for this sample were as follows: G.P.A. Major, 3.15; G.P.A. Education, 3.16; and G.P.A. Overall, 2.95. Mean ACT scores for Louisiana's examinees varied from a low of 15.78 in Social Studies to a high of 18.83 in Natural Sciences, with the mean ACT English ($\bar{X}$=17.98) and mean ACT Mathematics ($\bar{X}$=16.47) falling in between. The mean Composite ACT score for Louisiana's potential teachers was 17.39.

Louisiana's potential teachers' WCET scores correlated most highly (r=.79) with their ACT Composite scores, as indicated in Table 2. Among the WCET scores and subscores, the scores ranged from a high of .94 for the correlation of WCET and Composite to a low of .60 for the correlation of Written English Expression (WEE) to Science and Mathematics (SM). Intercorrelations seem to indicate consistency of sample performance across all subdivisions and subtests of the NTE. Intercorrelations of subtests of the Common Examinations were all significant at the .0001 level, but were not as strong as correlations of WCET with subtest intercorrelations, indicating more variability with subjects.

The correlations of Composite NTE scores with scores of the WCET followed the same basic pattern, with correlations being the highest with PE scores (r=.88), followed by correlations with SM scores (r=.78), LFASS scores (r=.76), and WEE scores (r=.71).

Of the various grade point averages (G.P.A.), G.P.A. Overall correlated highest with WCET scores (r=.50) and with NTE Composite scores (r=.50), followed closely by correlations with PE scores (r=.49), WEE scores (r=.44), SM scores (r=.41), and LFASS scores (r=.35). Correlations of G.P.A. Major with NTE scores and subscores ranged from a high of .44 with Composite scores to a low of .26 with LFASS scores. G.P.A. Education scores correlated highest with PE scores (r=.47) and lowest with LFASS scores (r=.31).

Of the various ACT scores, ACT Composite scores and Social Studies scores correlated highest with NTE scores and subscores. The correlation between ACT English scores and WEE scores was .69; between ACT Mathematics scores and SM scores, .63;

Table 2

Correlation Matrix for Louisiana's Potential Teachers
on the NTE and Other Selected Variables*

Variable	WCET	COMP	PE	WEE	LFASS	SM
WCET	1.00	.94	.91	.77	.86	.84
COMP		1.00	.88	.71	.76	.78
PE			1.00	.65	.67	.64
WEE				1.00	.62	.60
LFASS					1.00	.63
SM						1.00
G.P.A. Major	.40	.44	.42	.34	.26	.31
G.P.A. Education	.46	.46	.47	.40	.31	.36
G.P.A. Overall	.50	.50	.49	.44	.35	.41
ACT English	.67	.64	.60	.69	.54	.56
ACT Mathematics	.57	.56	.45	.48	.42	.63
ACT Social Studies	.73	.68	.62	.57	.68	.62
ACT Natural Sciences	.68	.64	.55	.54	.58	.66
ACT Composite	.79	.75	.66	.67	.66	.74

*All correlations were significant at the .0001 Level of Significance.

CODE KEY

WCET------Common Examinations of the NTE
COMP------NTE composite
PE--------Professional Education Subdivision of the Common Examinations
WEE-------Written English Expression Subdivision of the Common Examinations
LFASS-----Literature, Fine Arts, and Social Studies Subdivision of the Common Examinations
SM--------Science and Mathematics Subdivision of the Common Examinations
G.P.A.----Grade Point Average

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between ACT Social Studies scores and LFASS scores, .68; and between ACT Science and SM scores, .66. ACT Composite scores correlated .79 with WCET scores and .75 with NTE Composite scores.

Distribution and Comparison of Louisiana and National Means on the National Teacher Examinations and on the American College Test

Data were collected to explore and compare the distribution of Louisiana's students' mean scores in relation to the national mean scores on the National Teacher Examinations (NTE) Common Examinations and its subdivisions and on the American College Test (ACT) Composite and its area tests.

Weighted mean scores of Louisiana's students and weighted national mean scores on the Common Examinations and its subdivisions were calculated, as indicated in Table 3. Louisiana's mean scores (N=4,682) were higher than the national mean scores in all subdivisions of the Common Examinations and on the WCET, as graphically depicted in Figure 1. The difference in national and state scores was significant at the .001 level for the WCET and for all subdivisions of the Common Examinations.

ACT mean scores of Louisiana's students and national mean scores on ACT Composite and Area tests were calculated, as indicated in Table 4. Louisiana's mean scores were higher than the national mean scores on ACT English and were below the national mean on ACT Mathematics, Social Studies, Natural Sciences, and Composite, as graphically depicted in Figure 2. The difference in national and state scores was significant at the .001 level for ACT Composite and for all areas of ACT.

Predictor Model for National Teacher Examinations Composite Scores

Following investigation of the simple correlations between the National Teacher Examinations (NTE) Composite scores and subscores with selected population attribute variables, the next step was to seek answers to the last research question: What are the best predictors of the NTE Composite scores among the predictors ACT Composite and Area tests (English, Mathematics, Natural Sciences, and Social Studies),

Table 3

Summary of National Mean Scores and Louisiana's Mean Scores on the Common Examinations of the NTE and Its Subdivisions*

Source of Scores	Number	Mean PE Scores	Mean WEE Scores	Mean LFASS Scores	Mean SM Scores	Mean WCET Scores
National	67,732	222.00	55.30	134.50	139.00	551.00
Louisiana	4,682	227.92	56.88	136.08	143.68	564.82

*Scores reported in Weighted Form

CODE KEY

PE------Professional Education Subdivision of the Common Examinations

WEE-----Written English Expression Subdivision of the Common Examinations

LFASS---Literature, Fine Arts, and Social Studies Subdivision of the Common Examinations

SM------Science and Mathematics Subdivision of the Common Examinations

Figure 1

Graphic Depiction of National Mean Scores and Louisiana's Mean Scores on the Common Examinations of the NTE and Its Subdivisions*

*Scores reported in Weighted Form

———— National Scores

– – – – – Louisiana Scores

Table 4

Summary of National Mean Scores and Louisiana's
Mean Scores on the ACT and Its Areas

Source of Scores	Number	Mean English Scores	Mean Math Scores	Mean SS Scores	Mean Natl. Sci. Scores	Mean Composite Scores
National	2,702,104	17.50	16.90	16.70	20.60	18.00
Louisiana	4,463	17.98	16.47	15.78	18.83	17.39

CODE KEY

SS--------Social Studies

Natl.-----Natural Sciences

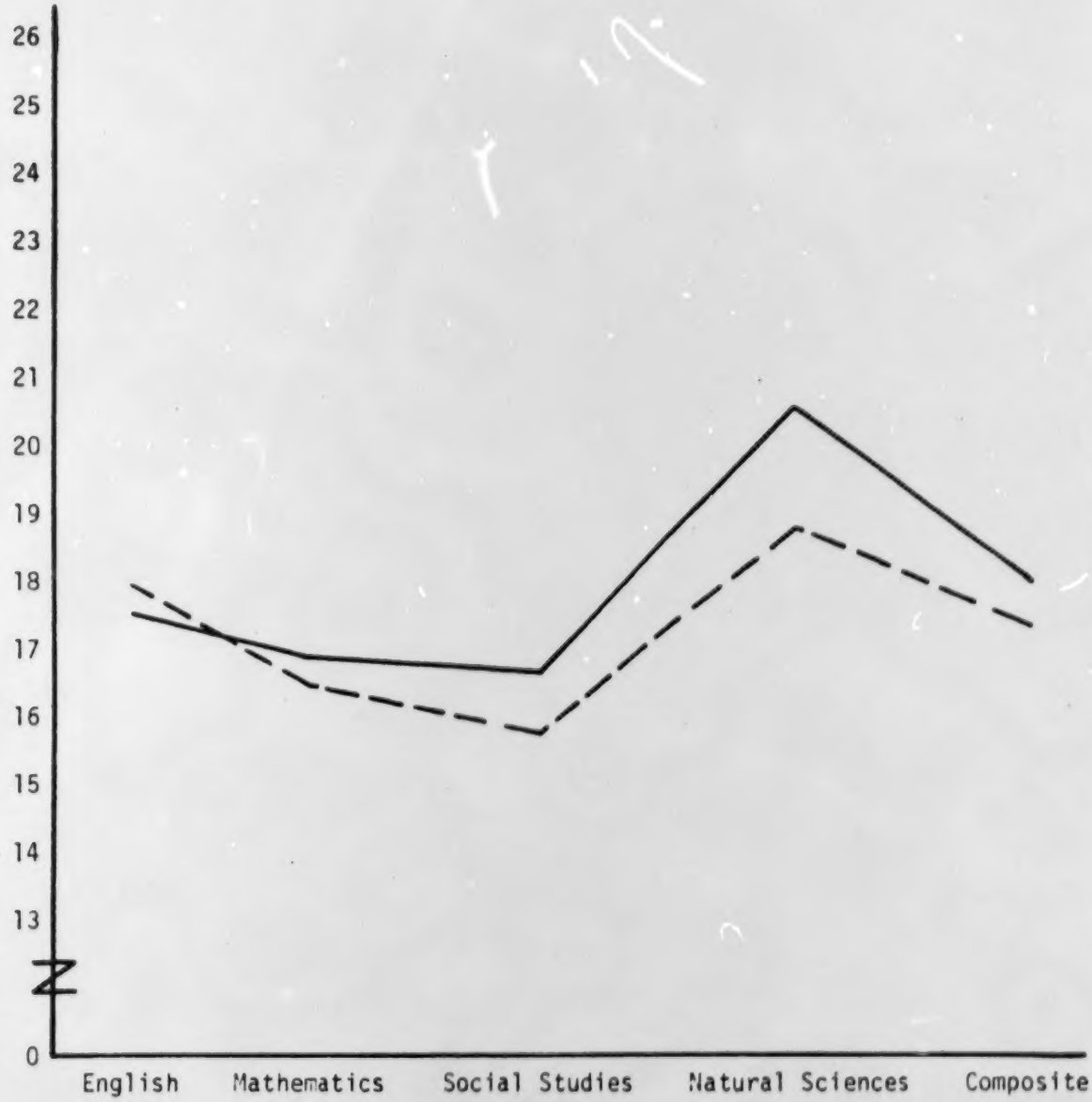

Figure 2

Graphic Depiction of National Mean Scores
and Louisiana's Mean Scores on the
ACT and Its Areas

——— National

— — — Louisiana Scores

Overall grade point average (GPA OV), grade point average in Education courses (GPA ED), and grade point average in Major (GPA MAJ)? Using the same data set as that previously used in the calculation of simple correlations, a stepwise regression analysis was run. Using the Statistical Analysis System (SAS) stepwise regression procedures, regressions were calculated for the best model for the prediction of NTE Composite scores using the eight predictors outlined above. For this analysis, the .1500 level of significance was set as the criterion for variable entry into the model.

Of the 5,647 subjects available for the study, complete data sets for all variables involved were available for 3,483 subjects. Only these subjects' scores were included in any analysis.

When all eight predictor variables were analyzed to determine the best single predictor of NTE Composite scores, ACT Overall (ACT OV) was selected (R^2=.5618). This produced a single variable regression equation of:

NTE COMP = 771.50 + 22.26 ACT OV

Analysis of variance was utilized to test the significance of the regression ($p < .0001$) and the significance of the contribution of the predictor ($p < .0001$). Both were significant.

The second variable selected for addition to the model was GPA MAJ (R^2=.5934). This produced the two variable predictor model:

NTE COMP = 619.87 + 59.81 GPA MAJ + 20.13 ACT OV.

The F for significance of the regression was 2539.01 ($p < .0001$).

The best three variable model was attained by adding the predictor ACT MATH, producing an R^2 of .6003. Analysis of the regression was significant ($p < .0001$). The three variable equation produced by this model was

NTE COMP = 613.83 + 59.64 GPA MAJ - 3.19 ACT MATH + 23.52 ACT OV.

Adding Grade Point Average in Education (GPA ED) as the fourth variable in the model produced an R^2 of .6029. The four-variable regression model produced was

NTE COMP = 596.95 + 44.51 GPA MAJ + 22.46 GPA ED - 3.16 ACT MATH + 23.11 ACT OV.

The F for significance of the regression was 1320.28 ($p<.0001$).

The best five-variable model was attained by replacing ACT Math with the predictor ACT English, producing an R^2 of .6082. Analysis of the regression was significant ($p<.0001$). The five variable equation produced by this model was

NTE COMP = 605.10 + 45.85 GPA MAJ + 20.26 GPA ED + 4.19 ACT ENG + 4.19 ACT SS + 11.65 ACT OV.

The best six variable-model was attained by replacing ACT OV with the predictor ACT Math, producing an R^2 of .6109. Analysis of the regression was significant ($p<.0001$). The six variable equation produced by this model was

NTE COMP = 601.59 + 45.18 GPA MAJ + 20.51 GPA ED + 6.91 ACT ENG + 2.49 ACT MATH + 6.72 ACT SS + 4.12 ACT SCI.

Adding GPA OV as the seventh variable in the model produced an R^2 of .6114. The seven-variable regression model produced was

NTE COMP = 598.07 + 39.05 GPA MAJ + 16.11 GPA ED + 13.80 GPA OV + 6.83 ACT ENG + 2.41 ACT MATH + 6.67 ACT SS + 4.10 ACT SCI.

The F for significance of the regression was 780.97 ($p<.0001$).

Adding ACT OV as the eighth variable in the model produced an R^2 of .6114. The eight-variable regression model was

NTE COMP = 598.32 + 39.01 GPA MAJ + 16.13 GPA ED + 13.78 GPA OV + 7.50 ACT ENG + 3.08 ACT MATH + 7.35 ACT SS + 4.77 ACT SCI - 2.69 ACT OV.

The F for significance of the regression was 683.33 ($p<.0001$).

In summary, the best single predictor of NTE Composite scores is ACT Overall scores, accounting for 56.2 percent of the variance. Addition of grade point average in Major (GPA MAJ) to ACT OV in a two variable model accounts for 59.3 percent of the variance, an increase of 3.1 percent. Adding a third variable, ACT MATH, increases variance accounted for to 60.0 percent, an increase of .7 percent. Enlarging the number of predictors to four by adding grade point average in Education (GPA ED) to the model only increased variance accounted for by .3 percent ($R^2=.6029$).

Maximum variance increase was reached with the five variable model by removing ACT MATH and adding ACT ENG and ACT SS. The new predictor model accounted for 60.8 percent of variance in the dependent variable an increase of .5 percent over the four variable model and an increase of 3.6 percent over the one variable model. Addition of two more variables to the model increased variance accounted for by only .03 percent (R^2= .6114).